

REMARKS/ARGUMENTS

The Examiner is thanked for the Office Action mailed April 23, 2008. The status of the application is as follows:

- Claims 1-10 are pending, claims 1-10 have been amended, and claims 11-20 have been added;
- Claims 1-10 are rejected under 35 U.S.C. 112, second paragraph;
- The drawings are objected to under 37 C.F.R. 1.83 (a);
- Claims 1, 2, 4, 6 and 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wang ("Novel Routing Schemes for IC Layout, Part 1: Tow-Layer Channel Routing") in view of Noguchi (2002/0109658);
- Claims 1, 2 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wang in view of Zhao et al. (US 5,962,856); and
- Claim 7 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, and to include all of the limitations of the base claim and any intervening claims.

The objections and rejections are discussed below.

The Allowed Claims

Applicant thanks the Examiner for indicating claim 7 would be allowed if rewritten to overcome the rejection under 35 U.S.C. 112, 2nd paragraph, set forth in this Office Action and to include all the limitations of the base claim and any intervening claims. Claim 18 has been added incorporating the claim aspects of claim 7 and base claim 1. Claims 19 and 20 depending from claim 18 have been added incorporating the claim aspects of claims 2 and 3. Accordingly, applicant respectfully submits that claim 18-20 are allowable.

The Rejection of Claims 1-10 under 35 U.S.C. 112, Second Paragraph

Claims 1-10 stand rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Particularly, the Office asserts with respect to claims 1, 2 and 10 that the term

"border column" is indefinite, specifically when the claims specify "from border column to border column." The Office asserts that it is unclear which "border columns" are connected by the lines. Claim 1, 2 and 10 have been amended by deleting the claimed aspects "from border column to border column." Accordingly, the rejections should be withdrawn.

With respect to claim 7, the Office asserts that it is unclear what is meant by "... has a second set of access lines, which lines pass through the array." Claim 7 has been amended to recite that the array is comprised of a "first and second portion of electronic field elements" and has "a second set of access lines, which access lines pass through said first portion of the array." Accordingly, this rejection should be withdrawn.

The Objection to the Drawings

The drawings are objected to under 37 C.F.R. 1.83(a). Particularly, the Office asserts that the drawings must show every feature of the invention specified in the claims. The Office asserts that the drawings currently show the zigzag arrangement, but do not show all the lines to be connected from one border column to the other. The claims have been amended by deleting the claimed aspects of the lines being connected from one border column to another. Accordingly, the foregoing objection is moot.

The Rejection of Claims 1, 2, 4, 6 and 8-10 under 35 U.S.C. 103(a)

Claims 1, 2, 4, 6 and 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wang in view of Noguchi. This rejection should be withdrawn because the combination of Wang and Noguchi does not teach or suggest all the limitations of the subject claims and, therefore, fails to establish a *prima facie* case of obviousness with respect to the subject claims.

To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, (CCPA 1974). MPEP §2143.03.

Independent claim 1 is directed to a device comprising an array of electronic field elements, the array consisting of rows and columns in the form of a matrix. Claim 1 requires, *inter alia*, a) a first subset of field elements is connected to precisely one access line among a set of several access lines, and b) the access line runs in zigzag fashion along a diagonal of the array.

and at each turning point connects two field elements from a same border column and two successive rows

The Office asserts that Wang discloses a number of methods for routing wires including zigzag arrangements (see Figures 8 and 9) among a matrix (introduction). The Office concedes that Wang does not disclose the specific types of devices in which this routing system is used. The Office asserts that Noguchi shows a display pixel array including a set of signal lines and a set of scanning lines but does not show the claimed routing arrangement. The Office concludes it would have been obvious to one of ordinary skill in the art to use the routing arrangements disclosed by Wang in any suitable matrix array, such as Noguchi, in order to benefit from shortened wire lengths and improved performance, as set forth by Wang (section 3.5).

However, claim 1 requires that each access line at each turning point connects two field elements from a same border column and two successive rows (see Figure 1). Neither Wang or Noguchi disclose this claim aspect. Wang discloses channel routing algorithms for VLSI chips and printed circuit (PC) boards. The wires comprising the channels do not interconnect any components (introduction; Figs. 8a-8c and 9) such as the field elements. Thus, each of the wires does not at each turning point connect two field elements as is required by claim 1. Noguchi discloses a plurality of pixel electrodes (not shown) arranged in the form of a matrix including a set of signal lines 3 extending in a column direction and a set of scanning lines 4 extending in a row direction arranged on a display area 10 (see ¶ [0044]). More significantly, the pixel electrodes and the arrangement of the pixel electrodes with respect to the signal lines 3 and scanning lines 4 is not shown in the drawing figures or described elsewhere in Noguchi. Hence, there is no teaching or suggestion in Noguchi that each signal line or scanning line at each turning point connect two pixels from a same border column and two successive rows.

Accordingly, applicant respectfully submits that the combination of Wang and Noguchi does not teach or suggest all the limitations of claim 1, and this rejection should be withdrawn.

Claim 2 depends from claim 1 and requires, *inter alia*, the secondary line runs in zigzag fashion along a diagonal of the array and at each turning point connects two field elements from a same border column and two successive rows (see Figure 1). For reasons similar to the reasons

given with respect to claim 1, neither Wang or Noguchi disclose this claim aspect. Accordingly, applicant respectfully submits that claim 2 is allowable, and this rejection should be withdrawn.

Claims 4, 6 and 8-9 depend from independent claim 1 and are allowable at least by virtue of their claim dependencies.

Independent claim 10 is directed to a method of accessing electronic field elements comprising an array substantially as claimed in independent claim 1. As such, the above discussion with respect to claim 1 applies *mutatis mutandis* to claim 10. Accordingly, applicant respectfully submits that claim 10 is allowable, and this rejection should be withdrawn.

The Rejection of Claims 1, 2 and 5 under 35 U.S.C. 103(a)

Claims 1, 2 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wang in view of Zhao et al. This rejection should be withdrawn because the combination of Wang and Zhao et al. does not teach or suggest all the limitations of the subject claims and, therefore, fails to establish a *prima facie* case of obviousness with respect to the subject claims.

As previously discussed, independent claim 1 is directed to a device comprising an array of electronic field elements, the array consisting of rows and columns in the form of a matrix. Claim 1 requires, *inter alia*, a) a first subset of field elements is connected to precisely one access line among a set of several access lines, and b) the access line runs in zigzag fashion along a diagonal of the array and at each turning point connects two field elements from a same border column and two successive rows.

The Office again asserts that Wang discloses a number of methods for routing wires including zigzag arrangements (see Figures 8 and 9) among a matrix (introduction). The Office concedes that Wang does not disclose the specific types of devices in which this routing system is used. The Office asserts that Zhao et al. discloses an imaging pixel array (abstract) including a set of control lines for selecting field elements and a set of data lines for reading from the field elements, but does not show the claimed line routing arrangement. The Office concludes it would have been obvious to one of ordinary skill in the art to use the routing arrangements disclosed by Wang in any suitable matrix array, such as that of Zhao et al., in order to benefit from shortened wire lengths and improved performance, as set forth by Wang (section 3.5).

However, claim 1 requires that the access line at each turning point connects two field elements from a same border column and two successive rows (see Figure 1). As previously discussed, Wang does not disclose this claim aspect. Zhao et al. discloses an active matrix 10 comprising a plurality of pixels, each comprising a pixel electrode 12, storage capacitor 14 and thin film transistor (TFT) 16. An external scanning control circuit 18 turns on the TFTs 16 one row at a time via a plurality of control lines 19, for transferring the image charge from the pixels to a plurality of data lines 20, and then to respective external charge amplifiers 22 (see col. 4, lines 37-44; Fig. 1). However, there is no teaching or suggestion in Zhao et al. that each control line 19 or each data line 20 at each turning point connect two pixels electrodes from a same border column and two successive rows. Accordingly, applicant respectfully submits that the combination of Wang and Zhao et al. does not teach or suggest all the limitations of claim 1, and this rejection should be withdrawn.

Claim 2 depends from claim 1 and requires, *inter alia*, that the secondary line runs in a zigzag fashion along a diagonal of the array and at each turning point connects two field elements from a same border column and two successive rows (see Figure 1). For reasons similar to the reasons given with respect to claim 1, neither Wang or Zhao et al. disclose this claim aspect. Accordingly, applicant respectfully submits that claim 2 is allowable, and this rejection should be withdrawn.

Claim 5 depends from independent claim 1 and is allowable at least by virtue of its dependency upon an allowable base claim.

New Claims 11-20

Newly added claims 11-20 emphasize various aspects. No new matter has been added. Entry and allowance of claims 11-20 is respectfully requested.

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Conclusion

In view of the foregoing, it is submitted that the claims distinguish patentably and non-obviously over the prior art of record. An early indication of allowability is earnestly solicited.

Respectfully submitted,

Michael J. Corrigan

Michael J. Corrigan, Reg. No. 42,440
Anthony M. Del Zoppo, III Reg. No. 51,606
Driggs, Hogg, Daugherty & Del Zoppo Co., L.P.A.
38500 Chardon Road
Willoughby Hills, Ohio 44094
Phone: 1 440 391 5100
Fax: 1 440 391 5101

Direct all correspondence to:
Yan Glickberg, Reg. No. 51,742
Philips Intellectual Property & Standards
595 Mineer Road
Cleveland, Ohio 44143
Phone: 1 440 483 3455
Fax: 1 914 323 0615